

SAF-B03-027
Close Out Sampling for 300-FF-²~~Y~~
618-5 Burial Ground
FINAL VALIDATION PACKAGE

MAIL COMPLETE COPY OF DATA PACKAGE TO:

Jeanette Duncan

BDZ 1/19/04
INITIAL/DATE

Jill Thomson

BDZ
INITIAL/DATE

SDG H2363

SAF-B03-027

RECEIVED
FEB 05 2004
EDMC

Date: 2 December 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Close Out Sampling for 300-FF-5 618-5 Burial Ground
Subject: Inorganics - Data Package No. H2363-LLI (SDG No. H2363)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2363-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J00YJ8	9/24/03	Soil	C	See note 1
J00YJ9	9/24/03	Soil	C	See note 1
J00YK0	9/24/03	Soil	C	See note 1
J00YK1	9/24/03	Soil	C	See note 1
J00YK2	9/24/03	Soil	C	See note 1
J00YK3	9/24/03	Soil	C	See note 1
J00YK4	9/24/03	Soil	C	See note 1
J00YK5	9/24/03	Soil	C	See note 1
J00YK6	9/24/03	Soil	C	See note 1
J00YK7	9/24/03	Soil	C	See note 1

1 - ICP metals by 6010B.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan, (DOE/RL-2001-48, Rev. 0, June 2002). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

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DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations.

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Recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 25% and a sample result below the instrument detection limit (IDL) are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery of -47%, all lead results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD of 138.3%, all lead results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate

Two sets of field duplicate samples (J00YJ8/J00YK2 and J00YK3/J00YK7) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 300 Area PQLs to ensure that laboratory detection levels meet the required criteria. All reported results met the analyte specific PQL.

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- **Completeness**

Data package No. H2363-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to a matrix spike recovery of -47%, all lead results were qualified as estimates and flagged "J". Due to an RPD of 138.3%, all lead results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-2001-48. Rev. 0, *300 Area Remedial Action Sampling and Analysis Plan*, June 2002.

Appendix 1
Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

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INORGANIC DATA QUALIFICATION SUMMARY

SDG: H2363	REVIEWER: TLI	DATE: 12/2/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Lead	J	All	RPD
Lead	J	All	MS recovery

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: BECHTEL-HANFORD																												
Laboratory: LLJ																												
Case		SDG: H2363																										
Sample Number		J00YJ8			J00YJ9			J00YK0			J00YK1			J00YK2			J00YK3			J00YK4			J00YK5			J00YK6		
Remarks		Duplicate																										
Sample Date		9/24/03			9/24/03			9/24/03			9/24/03			9/24/03			9/24/03			9/24/03			9/24/03			9/24/03		
Inorganics		PQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Arsenic		10	4.5		3.9		5.2		3.0		4.7		4.2		4.2		4.3		3.9									
Cadmium		0.5	0.23	U	0.23	U	0.24	U	0.24	U	0.47		0.24	U	0.23	U	0.22	U	0.23	U								
Chromium		1	13.2		14.7		11.6		11.1		13.5		8.8		10.1		9.6		11.3									
Lead		10	82.3	J	6.9	J	9.9	J	4.7	J	12.3	J	4.4	J	5.3	J	4.6	J	6.1	J								
Sample Number		J00YK7																										
Remarks		Duplicate																										
Sample Date		9/24/03																										
Inorganics		PQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q										
Arsenic		10	2.3																									
Cadmium		0.5	0.22	U																								
Chromium		1	9.2																									
Lead		10	3.8	J																								
NA=Not analyzed																												

000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/07/03

CLIENT: TNUHANFORD B03-027 H2363

LVL LOT #: 0309L605

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00YJ8	Arsenic, Total	4.5	MG/KG	2.4	6.0
		Cadmium, Total	0.23 u	MG/KG	0.23	6.0
		Chromium, Total	13.2	MG/KG	0.58	6.0
		Lead, Total	82.3 J	MG/KG	1.1	6.0
-002	J00YJ9	Arsenic, Total	3.9	MG/KG	2.4	6.0
		Cadmium, Total	0.23 u	MG/KG	0.23	6.0
		Chromium, Total	14.7	MG/KG	0.57	6.0
		Lead, Total	6.9 J	MG/KG	1.1	6.0
-003	J00YK0	Arsenic, Total	5.2	MG/KG	2.5	6.0
		Cadmium, Total	0.24 u	MG/KG	0.24	6.0
		Chromium, Total	11.6	MG/KG	0.59	6.0
		Lead, Total	9.9 J	MG/KG	1.1	6.0
-004	J00YK1	Arsenic, Total	3.0	MG/KG	2.5	6.0
		Cadmium, Total	0.24 u	MG/KG	0.24	6.0
		Chromium, Total	11.1	MG/KG	0.59	6.0
		Lead, Total	4.7 J	MG/KG	1.1	6.0
-005	J00YK2	Arsenic, Total	4.7	MG/KG	2.4	6.0
		Cadmium, Total	0.47	MG/KG	0.23	6.0
		Chromium, Total	13.5	MG/KG	0.57	6.0
		Lead, Total	12.3 J	MG/KG	1.1	6.0

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11/25/03

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/07/03

CLIENT: TNUHANFORD B03-027 H2363

LVL LOT #: 0309L605

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
-006	J00YK3	Arsenic, Total	4.2	MG/KG	2.5	6.0
		Cadmium, Total	0.24 u	MG/KG	0.24	6.0
		Chromium, Total	8.8	MG/KG	0.59	6.0
		Lead, Total	4.4 J	MG/KG	1.1	6.0
-007	J00YK4	Arsenic, Total	4.2	MG/KG	2.4	6.0
		Cadmium, Total	0.23 u	MG/KG	0.23	6.0
		Chromium, Total	10.1	MG/KG	0.58	6.0
		Lead, Total	5.3 J	MG/KG	1.1	6.0
-008	J00YK5	Arsenic, Total	4.3	MG/KG	2.3	6.0
		Cadmium, Total	0.22 u	MG/KG	0.22	6.0
		Chromium, Total	9.6	MG/KG	0.55	6.0
		Lead, Total	4.6 J	MG/KG	1.1	6.0
-009	J00YK6	Arsenic, Total	3.9	MG/KG	2.4	6.0
		Cadmium, Total	0.23 u	MG/KG	0.23	6.0
		Chromium, Total	11.3	MG/KG	0.58	6.0
		Lead, Total	6.1 J	MG/KG	1.1	6.0
-010	J00YK7	Arsenic, Total	2.3	MG/KG	2.3	6.0
		Cadmium, Total	0.22 u	MG/KG	0.22	6.0
		Chromium, Total	9.2	MG/KG	0.54	6.0
		Lead, Total	3.8 J	MG/KG	1.0	6.0

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11/25/03

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



Analytical Report

Client: TNU-HANFORD B03-027

LVL#: 0309L605

SDG/SAF#: H2364/B03-027

H2363 OK 11/7/03

W.O.#: 11343-606-001-9999-00

Date Received: 09-30-03

METALS CASE NARRATIVE

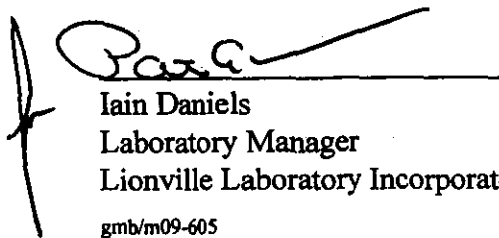
1. This narrative covers the analyses of 10 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 17 pages.

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<u>Sample ID</u>	<u>Element</u>	<u>PDS</u> <u>Concentration (ppb)</u>	<u>PDS</u> <u>% Recovery</u>
J00YJ8	Lead	1200	101.4

12. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.


 Iain Daniels
 Laboratory Manager
 Lionville Laboratory Incorporated
 gmb/m09-605

10-17-03
 Date

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS RECORD			
Collector R Fahlberg	Company Contact Jeff Lerch	Telephone No. 372-5904	Project Coordinator KESSNER, JH	Price Code 8K	Date 15 Days
Project Designation Close Out Sampling for 300-FF-1 618-5 Burial Ground		Sampling Location 618-5 Deep Zone	Saf No. B03-027	Air Quality	
Ce Chest No. ERC 96 019	Field Logbook No. EL 1395-8	COA RG61852600	Method of Shipment Fed EX		
Shipped To EBERLINE SERVICES (Formerly TMA)		Offsite Property No. A030 379	Bill of Lading/Air Bill No. See OSPC Form		

POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive Tie To J00 YJ6 Special Handling and/or Storage None	Preservation	None	None									
	Type of Container	aG	aG									
	No. of Container(s)	1	1									
	Volume	60mL	250mL									

000016	SAMPLE ANALYSIS				Isotopic Uranium	ICP Metals - 6010A (Add-on) (Arsenic, Barium, Cadmium, Chromium, Lead)											
	Sample No.	Matrix *	Sample Date	Sample Time													
	J00YJ8	SOIL		0900	X	X											
	J00YJ9	SOIL		0915	X	X											
	J00YK0	SOIL		0930	X	X											
	J00YK1	SOIL		0940	X	X											
	J00YK2	SOIL		0950	X	X											

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix * S-Soil SE-Sediment SW-Sludge St-Sludge W-Water U-Urinal A-Air DS-Dust LH-Liquid Y-Yeast W-Water L-Liquid
Relinquished By/Removed From R. Fahlberg	Date/Time 9.24.03	Received By/Stored In 1 A	Date/Time 9.24.03	1200		
Relinquished By/Removed From 1A 3228	Date/Time 9.29.03	Received By/Stored In R. Fahlberg	Date/Time 9.29.03	1000		
Relinquished By/Removed From ERC	Date/Time 1000	Received By/Stored In Fed Ex	Date/Time			
Relinquished By/Removed From FedEx	Date/Time 9/30/03	Received By/Stored In R. Fahlberg	Date/Time 1000			
Relinquished By/Removed From J1	Date/Time	Received By/Stored In	Date/Time			

LABORATORY SECTION	Received By:
FINAL SAMPLE DISPOSITION	Disposal Method:

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					
Collector R. Fahlberg		Company Contact Jeff Leach		Telephone No. 373-5904		Project Coordinator KESSNER, JH	
Project Designation Close Out Sampling for 300-FF-1 618-5 Burial Ground		Sampling Location 618-5 Station Zone		SAF No. B03-027		Price Code 8K Air Quality 15 Days	
Ice Chest No. ERC 96-019		Field Logbook No. EL 1395-8		COA RG61852600		Method of Shipment Fed EX	
Shipped To EBERLINE SERVICES (Formerly TMA)		Offsite Property No. A030 379		Bill of Lading/Air Bill No. See OSCP Form			
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive Tie To J00 YJ6		Preservation Type of Container No. of Container(s) Volume		None None aG aG 1 1 60mL 250mL			
Special Handling and/or Storage None				Isotopic Uranium ICP Metals - 6010A (Add-on) (Arsenic, Barium, Cadmium, Chromium, Lead)		RF 9-24-03	
SAMPLE ANALYSIS 000017							
Sample No.	Matrix *	Sample Date	Sample Time				
J00YK3	SOIL	9-24-03	0950	X	X		
J00YK4	SOIL	9-24-03	1005	X	X		
J00YK5	SOIL	9-24-03	1015	X	X		
J00YK6	SOIL	9-24-03	1025	X	X		
J00YK7	SOIL	9-24-03	0950	X	X		
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From R. Fahlberg		Date/Time 9-24-03 1200		Received By/Stored In LA 3728		Date/Time 9-24-03 1200	
Relinquished By/Removed From LA 3728		Date/Time 9-29-03 1000		Received By/Stored In R. Fahlberg		Date/Time 9-29-03 1000	
Relinquished By/Removed From R. Fahlberg		Date/Time 9-29-03 1000		Received By/Stored In Feck		Date/Time 9-29-03 1000	
Relinquished By/Removed From FedEx		Date/Time 9/30/03 1000		Received By/Stored In JPERM		Date/Time 1/30/03 1000	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time	
LABORATORY SECTION		Received By		Disposed By			
FINAL SAMPLE DISPOSITION		Disposal Method					

Appendix 5
Data Validation Supporting Documentation

**Appendix A –
Data Validation Checklists**

BHI-01435
Rev. 0

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	C	D	E
PROJECT: 300-FF-S	G18-S		DATA PACKAGE: H2363		
VALIDATOR: TLI	LAB: LLP		DATE: 11/25/03		
CASE:			SDG: H2363		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J00YJ8 J00YJ9 J00YK0 J00YK1 J00YK2					
J00YK3 J00YK4 J00YK5 J00YK6 J00YK7					
S&L					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No **N/A**

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? Yes No **N/A**
 Initial calibrations acceptable? Yes No **N/A**
 ICP interference checks acceptable? Yes No **N/A**
 ICV and CCV checks performed on all instruments? Yes No **N/A**
 ICV and CCV checks acceptable? Yes No **N/A**
 Standards traceable? Yes No **N/A**
 Standards expired? Yes No **N/A**
 Calculation check acceptable? Yes No **N/A**

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) Yes No N/A
ICB and CCB results acceptable? (Levels D, E) Yes No N/A
Laboratory blanks analyzed? Yes No N/A
Laboratory blank results acceptable? Yes No N/A
Field blanks analyzed? (Levels C, D, E) Yes No N/A
Field blank results acceptable? (Levels C, D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Comments: NO FB

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? Yes No N/A
MS/MSD results acceptable? Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
MS/MSD standards expired? (Levels D, E) Yes No N/A
LCS/BSS samples analyzed? Yes No N/A
LCS/BSS results acceptable? Yes No N/A
Standards traceable? (Levels D, E) Yes No N/A
Standards expired? (Levels D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Performance audit sample(s) analyzed? Yes No N/A
Performance audit sample results acceptable? Yes No N/A
Comments: Lead -47% T all NO PAS

Appendix A –
Data Validation Checklists

BHI-01435
Rev. 0

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	Yes	No	N/A
Duplicate results acceptable?	Yes	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	N/A
MS/MSD standards expired? (Levels D, E)	Yes	No	N/A
Field duplicate RPD values acceptable?	Yes	No	N/A
Field split RPD values acceptable?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments: _____

Lead 13870 - July

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	Yes	No	N/A
ICP serial dilution %D values acceptable?	Yes	No	N/A
ICP post digestion spike required?	Yes	No	N/A
ICP post digestion spike values acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments: _____

8. HOLDING TIMES (all levels)

Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ☒ Yes ☐ No ☐ N/A
Results supported in the raw data? (Levels D, E) ☐ Yes ☐ No ☒ N/A
Samples properly prepared? (Levels D, E) ☐ Yes ☐ No ☒ N/A
Detection limits meet RDL? ☒ Yes ☐ No ☐ N/A
Transcription/calculation errors? (Levels D, E) ☐ Yes ☐ No ☒ N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000024

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/07/03

CLIENT: TNUHANFORD B03-027 H2363
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0309L605

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
*****	*****	*****	*****	*****	*****	*****
BLANK1	03L0584-MB1	Arsenic, Total	0.42 u	MG/KG	0.42	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.10 u	MG/KG	0.10	1.0
		Lead, Total	0.20	MG/KG	0.19	1.0

000025

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/07/03

CLIENT: TNUHANFORD B03-027 H2363

LVL LOT #: 0309L605

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J00YJ8	Arsenic, Total	189	4.5	198	93.1	6.0
		Cadmium, Total	4.5	0.23u	4.9	91.8	6.0
		Chromium, Total	31.7	13.2	19.8	93.4	6.0
		Lead, Total	59.0	82.3	49.5	-47.	6.0

000026

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/07/03

CLIENT: TNUHANFORD B03-027 H2363

LVL LOT #: 0309L605

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J00YJ8	Arsenic, Total	4.5	5.5	20.0	6.0
		Cadmium, Total	0.23u	0.23u	NC	6.0
		Chromium, Total	13.2	13.1	0.76	6.0
		Lead, Total	82.3	15.0	138.3	6.0

000027

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 11/07/03

CLIENT: TNUHANFORD B03-027 H2363

LVL LOT #: 0309L605

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SAMPLE	SPIKED AMOUNT	SPIKED UNITS	%RECOV
LCS1	03L0584-LC1	Arsenic, LCS	958	1000	MG/KG	95.8
		Cadmium, LCS	24.5	25.0	MG/KG	98.0
		Chromium, LCS	49.7	50.0	MG/KG	99.4
		Lead, LCS	248	250	MG/KG	99.2

000028

13

Date: 2 December 2003
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: Close Out Sampling for 300-FF-5 618-5 Burial Ground
Subject: Radiochemistry - Data Package No. H2363-LLI (SDG No. H2363)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2363-EB which was prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J00YJ8	9/24/03	Soil	C	See note 1
J00YJ9	9/24/03	Soil	C	See note 1
J00YK0	9/24/03	Soil	C	See note 1
J00YK1	9/24/03	Soil	C	See note 1
J00YK2	9/24/03	Soil	C	See note 1
J00YK3	9/24/03	Soil	C	See note 1
J00YK4	9/24/03	Soil	C	See note 1
J00YK5	9/24/03	Soil	C	See note 1
J00YK6	9/24/03	Soil	C	See note 1
J00YK7	9/24/03	Soil	C	See note 1

1 - Isotopic uranium by alpha spectroscopy.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan, (DOE/RL-2001-48, Rev. 0, June 2002). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Data Requested by Client

000001

DATA QUALITY PARAMETERS

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 65-135%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

All accuracy results were acceptable.

000002

- **Laboratory Duplicates**

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 35%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicate

Two sets of field duplicate samples (J00YJ8/J00YK2 and J00YK3/J00YK7) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

No detection levels were specified.

- **Completeness**

Data package No. H2363 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

000003

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-2001-48. Rev. 0, *300 Area Remedial Action Sampling and Analysis Plan*, June 2002.

Appendix 1
Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2
Summary of Data Qualification

000007

METALS DATA QUALIFICATION SUMMARY

SDG: H2363	REVIEWER: TLI	DATE: 12/2/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned.			

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2363

7603-001

J00YJ8

D A T A S H E E T

SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309162-01</u>	Client sample id <u>J00YJ8</u>	
Dept sample id <u>7603-001</u>	Location/Matrix <u>618-5 Deep Zone</u>	<u>SOLID</u>
Received <u>09/30/03</u>	Collected/Weight <u>09/24/03 09:00</u>	<u>95.8 g</u>
% solids <u>98.5</u>	Custody/SAF No <u>B03-027-02</u>	<u>B03-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	5.77	0.63	0.12	1.0		U
Uranium 235	15117-96-1	0.283	0.13	0.12	1.0		U
Uranium 238	U-238	5.86	0.63	0.12	1.0		U

Close Out Smpl.300-FF-1 618-4 Burial

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/10/03</u>

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2363

7603-002

J00YJ9

D A T A S H E E T

SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R309162-02</u>	Client sample id <u>J00YJ9</u>	
Dept sample id <u>7603-002</u>	Location/Matrix <u>618-5 Deep Zone</u>	<u>SOLID</u>
Received <u>09/30/03</u>	Collected/Weight <u>09/24/03 09:15</u>	<u>104.3 g</u>
% solids <u>97.9</u>	Custody/SAF No <u>B03-027-02</u>	<u>B03-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	8.60	0.89	0.18	1.0		U
Uranium 235	15117-96-1	0.462	0.19	0.15	1.0		U
Uranium 238	U-238	8.87	0.93	0.15	1.0		U

Close Out Smpl.300-FF-1 618-4 Burial

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/10/03</u>

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2363

7603-003

J00YK0

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SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R309162-03</u>	Client sample id <u>J00YK0</u>	
Dept sample id <u>7603-003</u>	Location/Matrix <u>618-5 Deep Zone</u>	<u>SOLID</u>
Received <u>09/30/03</u>	Collected/Weight <u>09/24/03 09:30</u>	<u>92.8 g</u>
% solids <u>98.9</u>	Custody/SAF No <u>B03-027-02</u>	<u>B03-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	6.47	0.99	0.20	1.0		U
Uranium 235	15117-96-1	0.226	0.19	0.25	1.0	U	U
Uranium 238	U-238	6.28	0.94	0.20	1.0		U

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/10/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2363

7603-004

J00YK1

DATA SHEET

SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309162-04</u>	Client sample id <u>J00YK1</u>	
Dept sample id <u>7603-004</u>	Location/Matrix <u>618-5 Deep Zone</u>	<u>SOLID</u>
Received <u>09/30/03</u>	Collected/Weight <u>09/24/03 09:40</u>	<u>93.2 g</u>
% solids <u>99.0</u>	Custody/SAF No <u>B03-027-02</u>	<u>B03-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	1.67	0.31	0.10	1.0		U
Uranium 235	15117-96-1	0.081	0.065	0.12	1.0	U	U
Uranium 238	U-238	1.74	0.31	0.10	1.0		U

Close Out Smpl.300-FF-1 618-4 Burial

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/10/03</u>

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2363

7603-005

J00YK2

DATA SHEET

SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309162-05</u>	Client sample id <u>J00YK2</u>	
Dept sample id <u>7603-005</u>	Location/Matrix <u>618-5 Deep Zone</u>	<u>SOLID</u>
Received <u>09/30/03</u>	Collected/Weight <u>09/24/03 09:00</u>	<u>101.0 g</u>
% solids <u>98.6</u>	Custody/SAF No <u>B03-027-02</u>	<u>B03-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	4.48	0.55	0.11	1.0		U
Uranium 235	15117-96-1	0.167	0.10	0.13	1.0		U
Uranium 238	U-238	4.50	0.55	0.11	1.0		U

Close Out Smpl.300-FF-1 618-4 Burial

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Lab id <u>EBRLINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/10/03</u>

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2363

7603-006

J00YK3

DATA SHEET

SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R309162-06</u>	Client sample id <u>J00YK3</u>	
Dept sample id <u>7603-006</u>	Location/Matrix <u>618-5 Shallow Zone</u>	<u>SOLID</u>
Received <u>09/30/03</u>	Collected/Weight <u>09/24/03 09:50</u>	<u>91.4 g</u>
% solids <u>99.2</u>	Custody/SAF No <u>B03-027-03</u>	<u>B03-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.704	0.22	0.12	1.0		U
Uranium 235	15117-96-1	0.057	0.076	0.14	1.0	U	U
Uranium 238	U-238	0.563	0.19	0.12	1.0		U

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Lab id <u>EBRINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/10/03</u>

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EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2363

7603-007

J00YK4

DATA SHEET

SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309162-07</u>	Client sample id <u>J00YK4</u>	
Dept sample id <u>7603-007</u>	Location/Matrix <u>618-5 Shallow Zone</u>	<u>SOLID</u>
Received <u>09/30/03</u>	Collected/Weight <u>09/24/03 10:05</u>	<u>89.6 g</u>
% solids <u>99.4</u>	Custody/SAF No <u>B03-027-03</u>	<u>B03-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.906	0.23	0.10	1.0		U
Uranium 235	15117-96-1	0.017	0.033	0.13	1.0	U	U
Uranium 238	U-238	0.851	0.22	0.10	1.0		U

Close Out Smpl.300-FF-1 618-4 Burial

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/10/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2363

7603-008


J00YK5

DATA SHEET

SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309162-08</u>	Client sample id <u>J00YK5</u>	
Dept sample id <u>7603-008</u>	Location/Matrix <u>618-5 Shallow Zone</u>	<u>SOLID</u>
Received <u>09/30/03</u>	Collected/Weight <u>09/24/03 10:15</u>	<u>92.7 g</u>
% solids <u>99.8</u>	Custody/SAF No <u>B03-027-03</u>	<u>B03-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.874	0.32	0.20	1.0		U
Uranium 235	15117-96-1	0.124	0.12	0.24	1.0	U	U
Uranium 238	U-238	0.745	0.26	0.20	1.0		U

Close Out Smpl.300-FF-1 618-4 Burial

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/10/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2363

7603-009

J00YK6

D A T A S H E E T

SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309162-09</u>	Client sample id <u>J00YK6</u>	
Dept sample id <u>7603-009</u>	Location/Matrix <u>618-5 Shallow Zone</u> <u>SOLID</u>	
Received <u>09/30/03</u>	Collected/Weight <u>09/24/03 10:25</u> <u>91.4 g</u>	
% solids <u>99.6</u>	Custody/SAF No <u>B03-027-03</u> <u>B03-027</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.938	0.23	0.096	1.0		U
Uranium 235	15117-96-1	0.061	0.061	0.12	1.0	U	U
Uranium 238	U-238	1.05	0.23	0.096	1.0		U

Close Out Smpl.300-FF-1 618-4 Burial

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/10/03</u>

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2363

7603-010

J00YK7

DATA SHEET

SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309162-10</u>	Client sample id <u>J00YK7</u>	
Dept sample id <u>7603-010</u>	Location/Matrix <u>618-5 Shallow Zone</u>	<u>SOLID</u>
Received <u>09/30/03</u>	Collected/Weight <u>09/24/03 09:50</u>	<u>87.0 g</u>
% solids <u>99.1</u>	Custody/SAF No <u>B03-027-03</u>	<u>B03-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.776	0.21	0.099	1.0		U
Uranium 235	15117-96-1	0.078	0.063	0.12	1.0	U	U
Uranium 238	U-238	0.569	0.18	0.099	1.0		U

Close Out Smpl.300-FF-1 618-4 Burial

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/10/03</u>

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000021

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H2363 was composed of ten soil samples designated under SAF No. B03-027 with a Project Designation of: Close Out Sampling for 300-FF-1 618 Burial Ground.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on October 10, 2003.

2.0 ANALYSIS NOTES

2.1 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa C. Mannion
Melissa C. Mannion
Senior Program Manager

10/20/03
Date

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B03-027-02		Page 1 of 1	
Collector R Fahlberg		Company Contact Jeff Lerch		Telephone No. 373-5904		Project Coordinator KESSNER, JH		Price Code 8K	
Project Designation Close Out Sampling for 300-FF-1 618-5 Burial Ground		Sampling Location 618-5 Deep Zone		H2363 (7603)		SAF No. B03-027		Data Turnaround 15 Days	
Ice Chest No. ERC 99-069		Field Logbook No. EL 1395-8		COA RG61852600		Method of Shipment Fed EX		Air Quality <input type="checkbox"/>	
Shipped To EBERLINE SERVICES (Formerly TMA)		Offsite Property No. A030 400		Bill of Lading/Air Bill No. See OSPC Form					
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive Tie To J00YJ6 Special Handling and/or Storage None				Preservation	None	None			
				Type of Container	aG	aG			
				No. of Container(s)	1	1			
				Volume	60mL	250mL			
SAMPLE ANALYSIS <div style="text-align: right; margin-right: 50px;"><i>MEM 9/30/03</i></div>				Isotopic Uranium	ICP Metals - 6010A (Add-on) (Asenic, Cadmium, Chromium, Lead)	RE 9.24.03			
Sample No.	Matrix *	Sample Date	Sample Time						
J00YJ8	SOIL	9/24/03	0900	X	X				
J00YJ9	SOIL	9/24/03	0915	X	X				
J00YK0	SOIL	9/24/03	0930	X	X				
J00YK1	SOIL	9/24/03	0940	X	X				
J00YK2	SOIL	9/24/03	0950	X	X				
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix * S=Soil SE=Sediment SO=Solid SI=Sledge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
R. Fahlberg		9.24.03 1200		1 A		9.24.03 1200			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
1 A		9.29.03 1000		R. Fahlberg		9.29.03 1000			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
R. Fahlberg		9.29.03 1000		Fed EX					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Fed EX				R. Fahlberg		9.30.03 1000			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
LABORATORY SECTION		Received By		Title				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time	

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B03-027-03		Page 1 of 1	
Collector R Fahlberg		Company Contact Jeff Lerch		Telephone No. 373-5904		Project Coordinator KESSNER, JH		Price Code 8K Data Turnaround 15 Days	
Project Designation Close Out Sampling for 300-FF-1 618-5 Burial Ground		Sampling Location 618-5 Shallow Zone		H2363 (7603)		SAF No. B03-027		Air Quality <input type="checkbox"/>	
Ice Chest No. ERC 99.069		Field Logbook No. EL 1395-8		COA RG61852600		Method of Shipment Fed EX			
Shipped To EBERLINE SERVICES (Formerly TMA)		Offsite Property No. A030400		Bill of Lading/Air Bill No. See OSPC Form					
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive Tie To J00 YJ6 Special Handling and/or Storage None 000024			Preservation	None	None				
			Type of Container	aG	aG				
			No. of Container(s)	1	1				
			Volume	60mL	250mL				
SAMPLE ANALYSIS Isotopic Uranium ICP Metals - 6010A (Add-on) (Arsenic, Barium, Cadmium, Chromium, Lead) RF 9.24.03									
Sample No.	Matrix *	Sample Date	Sample Time						
J00YK3	SOIL	9.24.03	0950	X	X				
J00YK4	SOIL	9.24.03	1005	X	X				
J00YK5	SOIL	9.24.03	1015	X	X				
J00YK6	SOIL	9.24.03	1025	X	X				
J00YK7	SOIL	9.24.03	0950	X	X				
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS					
Relinquished By/Removed From		Date/Time 1200		Received By/Stored In		Date/Time 1200		Matrix * S=Soil SE=Soilment SO=Solid SI=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other	
K. Fahlberg R. Fahlberg		9.24.03		LA 3728		9.24.03			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
LA 3728		9.29.03 1000		R. Fahlberg P. Fahlberg		9.29.03 1000			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
R. Fahlberg R. Fahlberg		9.29.03 1000		Fed EX					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Fed EX				LA 3728		9.30.03 1000			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
LABORATORY SECTION		Received By		Title				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time	

Appendix 5

Data Validation Supporting Documentation

APPENDIX A **RADIOCHEMICAL DATA VALIDATION CHECKLIST**

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT: 300 FFS 618-5			DATA PACKAGE: H2363		
VALIDATOR: TKI		LAB: ER		DATE: 11/28/03	
CASE:			SDG: H2363		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	<u>Alpha Spectroscopy</u>	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			
SAMPLES/MATRIX					
J00YJ8 J00YJ9 J00YK0 J00YK1 J00YK2					
J00YK3 J00YK4 J00YK5 J00YK6 J00YK7					
Soil					

1. Completeness ~~X~~ N/A

Technical verification forms present? Yes No N/A

Comments: _____

2. Initial Calibration (Levels D, E) ~~X~~ N/A

Instruments/detectors calibrated? Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable? Yes No N/A

Appendix A – Radiochemical Data Validation Checklist

Standards Expired?Yes No N/A

Calculation check acceptable?Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E).....~~N/A~~

Calibration checked within required frequency?Yes No N/A

Calibration check acceptable?.....Yes No N/A

Calibration check standards traceable?.....Yes No N/A

Calibration check standards expired?Yes No N/A

Calculation check acceptable?Yes No N/A

Comments: _____

4. Background Counts (Levels D, E).....~~N/A~~

Background Counts checked within required frequency?Yes No N/A

Background Counts acceptable?.....Yes No N/A

Calculation check acceptable?Yes No N/A

Comments: _____

Appendix A – Radiochemical Data Validation Checklist5. Blanks (Levels B, C, D, E) ☐ N/A

Method blank analyzed within required frequency? Yes No N/A

Method blank results acceptable? Yes No N/A

Analytes detected in method blank? Yes No N/A

Field blank(s) analyzed? Yes No N/A

Field blank results acceptable? Yes No N/A

Analytes detected in field blank(s)? Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: WFB6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ☐ N/A

LCS /BSS analyzed within required frequency? Yes No N/A

LCS/BSS recoveries acceptable? Yes No N/A

LCS/BSS traceable? (Levels D,E) Yes No N/A

LCS/BSS expired? (Levels D,E) Yes No N/A

LCS/BSS levels correct? (Levels D,E) Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: _____

7. Chemical Carrier Recovery (Levels C, D, E) ☒ N/A

Chemical carrier added? Yes No N/A

Chemical recovery acceptable? Yes No N/A

Chemical carrier traceable? (Levels D, E) Yes No N/A

Appendix A – Radiochemical Data Validation Checklist

BHI-01433

Rev. 0

10. Duplicates (Levels C, D, E) ☐ N/A

Duplicates Analyzed at required frequency? ☒ Yes ☐ No ☐ N/A

RPD Values Acceptable? ☒ Yes ☐ No ☐ N/A

Transcription/Calculation Errors? (Levels D, E) ☐ Yes ☐ No ☒ N/A

Comments: _____

11. Field QC Samples (Levels C, D E) ☐ N/A

Field duplicate sample(s) analyzed? ☒ Yes ☐ No ☐ N/A

Field duplicate RPD values acceptable? ☒ Yes ☐ No ☐ N/A

Field split sample(s) analyzed? ☐ Yes ☒ No ☐ N/A

Field split RPD values acceptable? ☐ Yes ☐ No ☒ N/A

Performance audit sample(s) analyzed? ☐ Yes ☒ No ☐ N/A

Performance audit sample results acceptable? ☐ Yes ☐ No ☒ N/A

Comments: _____ NO FS/PAS

12. Holding Times (All levels)

Are sample holding times acceptable? ☒ Yes ☐ No ☐ N/A

Comments: _____

Appendix A – Radiochemical Data Validation Checklist13. Results and Detection Limits (All Levels)..... ☐ N/AResults reported for all required sample analyses?..... ☒ Yes ☐ No ☐ N/AResults supported in raw data?(Levels D, E)..... Yes ☐ No ☒ N/AResults Acceptable? (Levels D, E) Yes ☐ No ☒ N/ATranscription/Calculation errors? (Levels D, E)..... Yes ☐ No ☒ N/AMDA's meet required detection limits? Yes ☐ No ☒ N/ATranscription/calculation errors? (Levels D, E)..... Yes ☐ No ☒ N/AComments: NO PQLs

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2363

7603-012

Method Blank

METHOD BLANK

SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309162-12</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7603-012</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B03-027</u>	

ANALYTE	CAS NO	RESULT pCi/g	2 σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.032	0.064	0.12	1.0	U	U
Uranium 235	15117-96-1	0	0.039	0.15	1.0	U	U
Uranium 238	U-238	0	0.032	0.12	1.0	U	U

Close Out Smpl.300-FF-1 618-4 Burial

QC-BLANK 45762

000033

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-DS

Version 3.06

Report date 10/10/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2363

7603-011

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R309162-11</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7603-011</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B03-027</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Uranium 233/234	18.5	1.5	0.72	1.0		U	19.3	0.77	96	85-115	80-120
Uranium 235	15.5	1.4	0.14	1.0		U	15.7	0.63	99	84-116	80-120
Uranium 238	21.4	1.7	0.68	1.0		U	21.0	0.84	102	84-116	80-120

Close Out Smpl.300-FF-1 618-4 Burial

QC-LCS 45761

LAB CONTROL SAMPLES

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>10/10/03</u>

000034

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2363

7603-013

J00YJ8

DUPLICATE

SDG <u>7603</u>	Client/Case no <u>Hanford</u>	SDG <u>H2363</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R309162-13</u>	Lab sample id <u>R309162-01</u>	Client sample id <u>J00YJ8</u>
Dept sample id <u>7603-013</u>	Dept sample id <u>7603-001</u>	Location/Matrix <u>618-5 Deep Zone</u> <u>SOLID</u>
	Received <u>09/30/03</u>	Collected/Weight <u>09/24/03 09:00</u> <u>95.8 g</u>
	% solids <u>98.5</u>	Custody/SAF No <u>B03-027-02</u> <u>B03-027</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Uranium 233/234	5.36	0.61	0.14	1.0		U	5.77	0.63	0.12		7	26	
Uranium 235	0.358	0.16	0.12	1.0		U	0.283	0.13	0.12		23	97	
Uranium 238	5.58	0.62	0.12	1.0		U	5.86	0.63	0.12		5	25	

Close Out Smpl.300-FF-1 618-4 Burial

QC-DUP#1 45763

DUPLICATES

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>10/10/03</u>